PATENT APPLICATION

THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE HONORABLE BOARD OF PATENT APPEALS AND INTERFERENCES

In re the Application of

REN DA, et al.

Application No.: 09/942,420 Examiner: John J. Lee

Filed: August 30, 2001 Docket No.: LUTZ 2 00520
CASE NAME/NO. DA 9-12

For: INTEGRITY MONITORING FOR GEO-LOCATION SYSTEMS

BRIEF ON APPEAL

Appeal from Group 2618

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I. REAL PARTY IN INTEREST

The real party in interest for this appeal and the present application is Lucent Technologies Inc., by way of an Assignment recorded in the U.S. Patent and Trademark Office at Reel 012468, Frame 0957.

II. RELATED APPEALS AND INTERFERENCES

There are no prior or pending appeals, interferences or judicial proceedings, known to Appellant, Appellant's representative, or the Assignee, that may be related to, or which will directly affect or be directly affected by or have a bearing upon the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 1-16 are on appeal.

Claims 1-16 are pending.

Claims 1-16 are rejected.

IV. STATUS OF AMENDMENTS

No Amendment After Final Rejection has been filed.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The invention of claim 1 is directed to a method of performing integrity monitoring. With reference to FIGS. 2 and 3 and page 7, lines 20-36, and page 9, lines 1-8, the method includes selecting at least one ranging measurement associated with a first ranging source belonging to a first ranging source type (310); selecting at least one ranging measurement associated with a second ranging source belonging to a second ranging source type (310); and performing failure detection using the selected ranging measurements associated with the first and second ranging sources to determine whether either of the first or second ranging sources failed (340), wherein at least one ranging source type comprises a satellite system 24 and at least one ranging source type comprises a land-based wireless communication network 26.

Dependent claims 2 and 13 specify that the failure detection is performed using weighted ridge regression techniques (page 10, lines 1-31).

Dependent claims 4 and 12 add the step of performing failure isolation using the selected ranging measurements (page 9, lines 1-8).

Dependent claims 5-10 define the ranging measurements associated with the first or second ranging source. More particularly, claim 5 defines the ranging measurement as a PN phase offset measurement (page 6, lines 9-10), claim 6 defines the ranging measurement as a pilot phase offset measurement of a pilot signal transmitted by the first or second ranging source (page 6, lines 17-19), claim 7 defines the ranging measurement as a signal strength measurement of a signal transmitted by the first or second ranging source (page 6, lines 25-26), claim 8 defines the ranging measurement as a round trip delay between a receiver and the first or second ranging

source (page 6, lines 31-33), claim 9 defines the ranging measurement as a one way delay between a receiver and the first or second ranging source (page 6, lines 31-33), and claim 10 defines the ranging measurement as one that indicates an enhanced observed time difference between a receiver and the first or second ranging source (page 7, lines 1-4).

The invention of claim 11 is directed to an alternative method of performing integrity monitoring. With reference to FIGS. 2 and 3 and page 7, lines 20-36, and page 9, lines 1-8, the method includes extracting ranging measurements from ranging sources belonging to at least two ranging source types (310); selecting ranging measurement from the extracted ranging measurements (320); and performing failure detection using the selected ranging measurements to determine whether any of the ranging sources failed (340), wherein at least one ranging source type comprises a satellite system 24 and at least one ranging source type comprises a land-based wireless communication network 26.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The following grounds of rejection are presented for review:

1) Claims 1-4 and 11-16 were rejected as having been obvious under 35 U.S.C. §103(a) over Jolley et al. (US 6,323,803) in view of Chou (US 2002/0055817).

2) Claims 5-10 were rejected as having been obvious under 35 U.S.C. §103(a) over Jolley et al. (US 6,323,803) in view of Chou (US 2002/0055817) and in further view of Fernandez-Corbaton et al. (US 6,289,280).

VII. ARGUMENT

A. Claims 1-4, 11-16 Would Not Have Been Obvious Under 35 U.S.C. §103(a) Over Jolley et al. (US 6,323,803) In View Of Chou (US 2002/0055817).

1. Claims 1-4, 11-16

The present invention performs integrity monitoring of one ranging source type using another ranging source type. In this case, the two ranging source types are a Global Positioning System (GPS) 24 and a land-based wireless communications network 26. Thus, ranging information from the wireless network 26 may be used to monitor the integrity of ranging information obtained from the GPS 24 and ranging information from the GPS 24 may be used to monitor the integrity of ranging information obtained from the wireless network 26.

For example, the wireless terminal 22 may select ranging measurements extracted from GPS signals 30-*j* and from base station signals 36-*p* to perform integrity monitoring.

This concept is exemplified in claims 1 and 11, as previously amended, which provide:

> 1. A method of performing integrity monitoring comprising the steps of:
>
> selecting at least one ranging measurement associated with a first ranging source belonging to a first ranging source type;
>
> selecting at least one ranging measurement associated with a second ranging source belonging to a second ranging source type; and
>
> performing failure detection using the selected ranging measurements associated with the first and second ranging sources to determine whether either of the first or second ranging sources failed, *wherein at least one ranging source type comprises a satellite system and*

at least one ranging source type comprises a land-based wireless communication network.

* * *

11. A method of performing integrity monitoring comprising the steps of:

extracting ranging measurements from ranging sources belonging to at least two ranging source types;

selecting ranging measurement from the extracted ranging measurements; and

performing failure detection using the selected ranging measurements to determine whether any of the ranging sources failed, *wherein at least one ranging source type comprises a satellite system and at least one ranging source type comprises a land-based wireless communication network. (Emphasis added.)*

Applicant submits that neither Jolley nor Chou discloses at least the aforementioned features of claims 1 and 11.

In particular, it is submitted that the primary citation to Jolley does not disclose the claimed "*performing failure detection using the selected ranging measurements to determine whether any of the ranging sources failed, wherein at least one ranging source type comprises a satellite system and at least one ranging source type comprises a land-based wireless communication network.*" Accordingly, without conceding the propriety of the asserted combination, the asserted combination is likewise deficient, even in view of the knowledge of one of ordinary skill in the art.

The primary reference, Jolley, provides for incremental broadcast of GPS navigation data in a wireless network (Jolley, Col. 5, lines 43-67, to Col. 6, lines 1-51). As disclosed in Jolley, the GPS-MS 20 comprises a typical mobile station having a cellular transceiver for sending and receiving radio signals between itself and the

wireless communication network system 10. The GPS-MS 20 also includes an integrated GPS receiver for receiving composite signals from visible GPS satellites, such as the satellite 24. The GPS-MS 20 is programmed to make GPS positioning measurements using the composite signals and navigation assistance data received from the wireless communication network system 10. The types of GPS assistance data include (a) orbital modeling information for visible satellites and (b) DGPS corrections. The orbital modeling information consists of navigation information including satellite ephemeris and clock corrections, or almanac data. This data is relatively large, and may be on the order of approximately 5000 bits for ten satellites. Providing the navigation information from the network system 10 means that the GPS-MS 20 does not have to demodulate it from the respective GPS satellite signals, such as the signal 32 in FIG. 1. The DGPS corrections are used to mitigate atmospheric, orbital, and Selective Availability (SA) errors in the ranges to their respective satellites that are measured by the GPS-MS 20 and used for position computation. This data is relatively small, but requires frequent updates, on the order of 30 seconds or less, due to the time-varying nature of the SA degradation. The DGPS corrections improve the horizontal position accuracy of the GPS-MS 20 from 50 m (RMS) to 5-10 m (RMS), which is important for applications such as personal navigation.

The broadcast capacity of each cell or BTS is relatively limited (Jolley, Col. 6, lines 52-67). Therefore, Jolley suggests that it is not practical to deliver the larger navigation assistance over a broadcast bearer. Thus, the wireless communication network system 10 utilizes several procedures for providing GPS assistance information to the GPS-MS 20. The first procedure is that when the GPS-MS 20 powers on, it uses a dedicated point-to-point channel 28 to request and receive both orbital modeling

information and DGPS correction assistance from the network 10. This dedicated channel may be established specifically for this purpose, or a logical channel established for another purpose may be used for this communication between the GPS-MS 20 and the network system 10. Meanwhile, the DGPS correction data is broadcast on each cell's BCCH or another broadcast bearer. The DGPS broadcast data for each cell, such as the cell 18, is updated every thirty seconds or less by the BSC 14.

According to Jolley, the two aforementioned procedures address the primary operational scenarios (Jolley, Col. 7, lines 13-20). However, a problem occurs when the orbital modeling information, particularly the navigation information, must be updated for all GPS-MS in a geographic region, for example, a cell. Apparently, this problem may be solved by parsing the updated information and adding it to unused portions of broadcast messages. In this manner, all GPS-MS in the cell 18 can receive the updated navigation data without having to occupy dedicated point-to-point channels 28 and other network resources, such as an MSC or BSC

It must be pointed out that Jolley does not even suggest using *an alternative ranging source type*, such as a land-based wireless network, to monitor the integrity of the GPS. Jolley, in fact, relates to a method of *broadcasting GPS correction data* as opposed to a method of *detecting a failure in a satellite*. Indeed, the Final Office Action concedes that the primary citation to Jolley does not disclose the features of the claims 1 and 11, including that at least one ranging source type comprises a satellite system and at least one ranging source type comprises a land-based wireless communication network.

Nonetheless, the Final Office Action rejects independent claims 1 and 11, contending that the secondary citation to Chou provides the necessary disclosures.

(Final Office Action, page 3.) It is submitted that the secondary citation to Chou does not remedy the conceded deficiencies in Jolley.

Chou relates to the use of multiple communication platforms to ensure at least one of the existing communication channels works at any given time and at any given location (Chou, at page 1, paragraph [0008]). Chou, at page 4, paragraph [0049] expressly teaches a location detection component or section 26 that is used to detect in real-time the location of the object in which SLIP is installed. The component 26 is a combination of the engine board 28 capable of receiving satellite signals of the global positioning system, a radio frequency unit 30 to transmit and receive location information through a terrestrial communication network, and any other electronic device that can be used to effectively detect the location of the object. The location detection component is further described on page 4, paragraphs [0050] to [0054]. Chou does not disclose performing failure detection using selected ranging measurements to determine whether any of the ranging sources failed, wherein at least one ranging source type comprises a satellite system and at least one ranging source type comprises a land-based wireless communication network. Thus, applicants submit that Chou does not add anything that would remedy the aforementioned deficiencies in Jolley.

Also, Applicant respectfully submits that one of ordinary skill would not have been motivated to combine Jolley with Chou.

Accordingly, withdrawal of the rejection of independent claims 1 and 11 under 35 U.S.C. 103(a) is respectfully requested.

2. Claims 2 and 13

Claims 2 and 13 are separately patentable as well. These claims include the feature of performing failure detection using weighted ridge regression techniques. The principles of WRR are based on a weighing technique and a ridge regression technique. (Specification, page 10, lines 1-9). The weighing technique of WRR gives proper weight to each of ranging measurements when determining a positioning solution.

The Final Office Action on page 4 suggests that Jolley discloses these features. Jolley discusses a Mobile Location Center (MLC) 16 that captures DGPS correction data from the DGPS receiver 22 and sends the data to the BSC 14 via the network (Jolley, Col. 7, lines 51-58). However, Jolley simply fails to discuss applying WRR techniques to such data. As such, Jolley cannot be reasonably interpreted to disclose the features of claims 2 and 13. The other cited references fail to overcome this deficiency.

3. Claims 4 and 12

Claims 4 and 12 are separately patentable as well. These claims include the feature of performing failure isolation using the selected ranging measurements. This step is used to isolate the failed satellite, which exhibits a characteristic bias line that lies along the parity vector *p*. The cited references fail to disclose this feature.

B. Claim Claims 5-10 Would Not Have Been Obvious Under 35 U.S.C. §103(a) Over Jolley et al. (US 6,323,803) In View Of Chou (US 2002/0055817) And In Further View Of Fernandez-Corbaton et al. (US 6,289,280).

Dependent claims 5-10 define the ranging measurements associated with the first or second ranging source. More particularly, claim 5 defines the ranging measurement as a PN phase offset measurement, claim 6 defines the ranging

measurement as a pilot phase offset measurement of a pilot signal transmitted by the first or second ranging source, claim 7 defines the ranging measurement as a signal strength measurement of a signal transmitted by the first or second ranging source, claim 8 defines the ranging measurement as a round trip delay between a receiver and the first or second ranging source, claim 9 defines the ranging measurement as a one way delay between a receiver and the first or second ranging source, and claim 10 defines the ranging measurement as one that indicates an enhanced observed time difference between a receiver and the first or second ranging source.

The Final Office Action concedes that Jolley and Chou do not disclose the aforementioned features of claims 5-10 (Final Office Action, page 6). Nonetheless, the Final Office Action rejects claims 5-10, contending that the citation to Fernandez-Corbaton provides these necessary disclosures. (Final Office Action, page 6). This contention is respectfully traversed.

Fernandez-Corbaton relates to locating the position of devices and discusses various measurements (Fernandez-Corbaton, Col. 2, lines 16-31, Col. 3, lines 19-67, to Col. 4, lines 1-54). Fernandez-Corbaton, however, does not teach taking such measurements for two types of ranging devices, namely, satellite systems and land-based wireless communication networks. Thus, Fernandez-Corbaton does not provide a disclosure that remedies the aforementioned, conceded deficiencies in the primary citation to Jolley and the secondary citation to Chou.

Also, Applicant respectfully submits that one of ordinary skill would not have been motivated to combine Jolley with Chou and Fernandez-Corbaton.

Accordingly, withdrawal of the rejection of claims 5-10 under 35 U.S.C. 103(a) is respectfully requested.

CONCLUSION

For all of the reasons discussed above, it is respectfully submitted that the rejections are in error and that claims 1-16 are in condition for allowance. For all of the above reasons, Appellants respectfully request this Honorable Board to reverse the rejections of claims 1-16.

Respectfully submitted,

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APPENDICES

VIII. CLAIMS APPENDIX

Claims involved in the Appeal are as follows:

LISTING OF CLAIMS:

1. (Previously Presented) A method of performing integrity monitoring comprising the steps of:

selecting at least one ranging measurement associated with a first ranging source belonging to a first ranging source type;

selecting at least one ranging measurement associated with a second ranging source belonging to a second ranging source type; and

performing failure detection using the selected ranging measurements associated with the first and second ranging sources to determine whether either of the first or second ranging sources failed, wherein at least one ranging source type comprises a satellite system and at least one ranging source type comprises a land-based wireless communication network.

2. (Original) The method of claim 1, wherein failure detection is performed using weighted ridge regression techniques.

3. (Original) The method of claims 1 or 2 comprising the additional step of:

performing failure detection using the selected ranging measurements associated with the first and second ranging sources.

4. (Previously Presented) The method of claims 1 or 2 comprising the additional step of: performing failure isolation using the selected ranging measurements.

5. (Original) The method of claims 1 or 2, wherein the ranging measurement associated with the first or second ranging source is a PN phase offset measurement.

6. (Original) The method of claims 1 or 2, wherein the ranging measurement associated with the first or second ranging source is a pilot phase offset measurement of a pilot signal transmitted by the first or second ranging source.

7. (Original) The method of claims 1 or 2, wherein the ranging measurement associated with the first or second ranging source is a signal strength measurement of a signal transmitted by the first or second ranging source.

8. (Original) The method of claims 1 or 2, wherein the ranging measurement associated with the first or second ranging source indicates a round trip delay between a receiver and the first or second ranging source.

9. (Original) The method of claims 1 or 2, wherein the ranging measurement associated with the first or second ranging source indicates a one way delay between a receiver and the first or second ranging source.

10. (Original) The method of claims 1 or 2, wherein the ranging measurement associated with the first or second ranging source indicates an enhanced observed time difference between a receiver and the first or second ranging source.

11. (Previously Presented) A method of performing integrity monitoring comprising the steps of:

extracting ranging measurements from ranging sources belonging to at least two ranging source types;

selecting ranging measurement from the extracted ranging measurements; and

performing failure detection using the selected ranging measurements to determine whether any of the ranging sources failed, wherein at least one ranging source type comprises a satellite system and at least one ranging source type comprises a land-based wireless communication network.

12. (Original) The method of claim 11 comprising the additional step of:

performing failure isolation using the selected ranging measurements.

13. (Original) The method of claim 11, wherein failure detection is performed using weighted ridge regression techniques.

14. (Original) The method of claims 11, 12 or 13, wherein all the extracted ranging measurements are selected.

15. (Original) The method of claim 11,12 or 13, wherein the step of selecting ranging measurements comprises the steps of:

selecting ranging measurements associated with a first ranging source from the extracted ranging measurements; and

selecting ranging measurements associated with a second ranging source from the extracted ranging measurements if the selected ranging measurements associated with the first ranging source is insufficient to perform failure detection or failure isolation.

16. (Original) The method of claim 11, 12 or 13, wherein the step of selecting ranging measurements is based on perceived reliability associated with each of the extracted ranging measurements.

IX. EVIDENCE APPENDIX

NONE

X. RELATED PROCEEDINGS APPENDIX

NONE